GREENE — PLANTAE BAKERIA

2 PART 1

PLANTÆ BAKERIANÆ

By EDW. L. GREENE,

AND OTHERS.

VOLUME II.

FASCICLE I.

FUNGI TO GRAMINEÆ.

Price, Forty Cents.

INTRODUCTORY.

Mr. Baker's ample and most interesting collection of the year 1899 was made, as his own brief and pointed Itinerary will indicate, along the borders of southwestern Colorado and adjacent New Mexico. The field was one wisely selected, as the large proportion of new plants obtained sufficiently declares; while the great extent of the collection shows how vast an amount of travelling and of other physical labor the zeal and industry of one strong and vigorous young man can accomplish in a single season, and as it were single handed.

Our report upon this rich and beautiful collection will constitute Volume II of the PLANTÆ BAKERIANÆ. The material has, at this date, for the most part been quite carefully studied, and it is hoped that at intervals not widely separated the succeeding instalments of the volume may reach the hands of the subscribers to the sets.

Inasmuch as this second volume will inevitably catalogue many species that were reported in the first volume, the names of such as are, as it were, duplicated in the collection of 1899, will be printed in italics here, only such being excepted as were published as new in the first volume. The names of these will be given in the usual small capital type.

EDW. L. GREENE.

Catholic University of America,
Washington, D. C., 11 March, 1901.

9415—1

Itinerary.

By Carl F. Baker.

The first camp of 1899 was established early in March at Hermosa, Colorado, at about 6,700 feet altitude, in the upper Animas Valley and on the west slope of the Needle Mountains. At this time, alder and the first willows were in bloom, and a few days later the first *Cymopterus* appeared. A few unopened flower buds of *Townsendia sericea* were also seen. During this month special attention was given to mosses, lichens and fungi, with good results. By April 1 *Pulsatilla* began to bloom.

On April 10 the second camp was made on the banks of the San Juan River, just below the town of Aztec, New Mexico, at an altitude of about 5,500 feet. This region is characterized by sand hills and gravelly mesas, sparingly covered with piñon pine and cedars, the whole very, very dry. The hills along the extreme southern border of Colorado do not differ essentially in many places from the Aztec hills, and the distance is not great. Undoubtedly most of the plants found at Aztec will also be found in Colorado. Many things were coming into bloom when camp was made at Aztec. During the month it was found that a very remarkable and evanescent flora existed among these hills. This flora appears during the very earliest warm days of spring. The plants arise from perennial bases, flower and fruit very rapidly, and have passed before hardly any of the plants usually considered so characteristic of the region are in their prime. Of most things, specimens were few and scattering. Miles and miles of the interminable piñon hills were tramped over to secure enough for issuance. On many of the days, the cold northwest winds were extremely bitter.

The statement that all plants in the '99 sets from this locality were taken during April or the first few days in May has seemed surprising, even to those best acquainted with collecting in the southwest. Summer and fall collecting in this locality would unquestionably give very interesting results.

During the early days of May camp was moved far up the valley of the Rio de los Pinos to the lower end of Graham's Park at an altitude of 7,800 feet. Here the results of a cold, dry spring were very evident, and collecting was poor.

On the 15th of the month camp was moved down the valley to Los Pinos P. O. (also known as Bayfield) on the same river, at about 7,000 feet altitude. This place is just north of the Ute Reservation line, and on the zonal division between *Pinus edulis* (piñon) and *Pinus ponderosa*. Here were still further signs of drought. Collecting was necessarily largely confined to the river bottoms and ground moistened by seepage from irrigating ditches.

On June 1 camp was moved to Arboles, in the river bottom at the junction of the Rio San Juan and Rio Piedra, only a few miles above the New Mexican border. Collections were made here and also at Rosa, New Mexico. Numerous large flocks of sheep were rapidly devastating the narrow bottoms. The destruction could scarcely have been more complete had the work been done by fire. A number of very interesting plants were found among the very dry sandy hills and along the stony mesa banks,—among them a new *Coleosanthus*, two new Astragali, and a new *Carduus*. As at Aztec, these hills are covered sparsely with piñon, pine and cedar, though otherwise the two localities are very distinct.

The next move made was up the Rio Piedra to Piedra

P. O., at about 7,000 feet altitude and well within the *Pinus ponderosa* zone. As will be seen from the Colorado Forestry Commission map, this zone curves strongly to the southeast, east of Durango, following the trend of the San Juan range. The road up the Piedra valley is new and extremely rough. An entire lack of bridges necessitated fording the river many times. Frequently the wagon wheels became wedged among the boulders of the river bed, compelling the carrying out of the entire load through the ice cold waters, by hand. *Habenaria hyperborea* was unexpectedly found about a cool spring in a dark shady gulch near Piedra and a new *Cypripedium* at the same place.

During the last of July a move was made to Pagosa Springs (at about 7,100 feet) over a good road passing through magnificent forests of *Pinus ponderosa.* The end of these forests is in sight, their destruction being actively under way now. The desolation caused by the lumberman and the fires which follow in his wake, is an evidence of an appalling lack of foresight, not possible in the more scientifically enlightened countries. In a favorable year Pagosa Springs would unquestionably be the most promising headquarters in southwestern Colorado for mountain botanizing. It is the center of a wonderful region, many distinct topographical areas being readily accessible. The unusually fine hot springs at this place attract many tourists through the season. Above this point are some of the finest natural meadows in the State. Under ordinary circumstances, at this season of the year there is still much snow on the surrounding mountains. But in 1899 none could be seen and the terrible drought was at its height. Sheep and cattle were hurried up from the lower levels, though many died of hunger and thirst. The most striking plant at this point was *Rhamnus Smithii.*

About August 1 another move was made over a road just built for mining purposes to Camp Loraine, in a narrow basin between Pagosa Peak and Saddle Mountain, at an altitude of about 9,000 feet. This whole basin is richly watered by small streams, but sheep and drought together had, during 1899, devastated the above-timber country. From this basin as a base, expeditions by foot were made for many miles about, over the surrounding mountains, an elevation of 12,500 feet being reached at several points. The results from above timber were very disappointing, though as full advantage as possible was taken of the richer vegetation below. Below timber line these mountains are richly clothed with magnificent forests of spruce—principally *Picea Engelmannii*. Deer and bear were abundant here and mountain lion frequent. Black grouse could also be had at any time. At this time should be acknowledged many kindnesses received from a very affable and whole-hearted gentleman, Mr. W. R. Black, of Pagosa Springs, part owner of the promising Baritone Wonder and Omaha mines near Camp Loraine. He gave freely all the needed information as to trails, topography, meteorology, and all similar matters. Camp at this point was regretfully broken up on August 30.

A ten days' stop at Chama, New Mexico, completed the season's work. During this ten days a trip was made up on Cumbres Pass, where an elevation of 10,000 feet was reached. But the sheep had been there first.

The collecting was done throughout by one person. It would have been entirely possible to have accomplished far more had the season and other conditions been more favorable. Whatever success was attained was due in no small measure to the faithful services of the camp-hand, an Alabama negro from Prof. Earle's station force. This man's

very unusual value lay not so much in his great strength and endurance, as in the fact that he would do exactly as told.

Throughout the field work constant reference was made to the very useful and minutely exact topographical maps lately issued by the Geological Survey, as well as to those of the Hayden Survey. Mention should also be made of the very interesting and valuable though not wholly correct map in the Biennial Report of the Forest Commissioner of the State of Colorado for the years 1887 and 1888.

CATALOGUE.

FUNGI.

By F. S. EARLE.

By the subjoined enumeration it will be seen that Mr. Baker's collection of 1899 is rich in new species of Ascomycetes, in this regard surpassing the collection made by Baker, Earle and Tracy in the same general region in the year 1898. The present list of species would have been more extensive had not much of the material collected on dead stems of herbaceous plants in early spring proven immature and thereby indeterminable. Those of the same habitat gathered in August, and even in July, were for the most part in good condition. This is especially true of species belonging to the Mycospærellaceæ, and the Pleosporaceæ. Specimens belonging to those families in which the perithecia on hard-carbonaceous, such as the Amphisphæraciæ and Lophiostomataceæ, usually contained recognizable asci and spores which had been found the year before, but were not in satisfactory condition.

Thanks are due to Dr. J. C. Arthur for aid in connection with the Uredinales; to Dr. L. M. Underwood for determining the species of *Polyporus*, and to Mr. David Griffiths for careful cultural studies of the Sordariaceæ.

USTILAGINACEÆ.

USTILAGO CARICIS, Fckl. Symb. 39. On *Carex elynoides*, Holm, near Pagosa Peak, Colo., at 12,000 feet, 26 Aug.; n. 89.

MELAMPSORACEÆ.

CRONARTIUM ASCLEPIADEUM THESII, Beck, Lea Catal. 71. On *Comandra*, at 8,000 feet, near Pagosa Peak, 30 Aug.; n. 22.

MELAMPSORA FARINOSA, Schrœt. Pilz. Schles. 360. On leaves of willow at Pagosa Springs, 21 July; n. 35.

PUCCINIACEÆ.

Æcidium abundans, Peck. At 9,000 feet, near Pagosa Peak, 27 Aug., on leaves of *Symphoricarpus*; n. 1.

ÆCIDIUM ALLENII, Clinton, Rep. N. Y. Mus. xxiv. 93. On leaves and twigs of *Lepargyrea argentea*, at Piedra, Colo., 14 July; n. 2.

ÆCIDIUM ASTERUM, Schw. Syn. Car. 67. At Chama, N. Mex., 8 Sept., on *Solidago*; n. 3.

Æcidium Clematitis, DC. Pagosa Springs, Colo., 18 July, on *Clematis hirsutissima*; n. 4. Again at Piedra, 15 July, on *C. ligusticifolia*.

ÆCIDIUM FENDLERI, Tracy & Earle, Pl. Baker, i. 17. At Pagosa Springs, 21 July, on *Berberis Fendleri*; n. 5.

ÆCIDIUM HEMISPHÆRICUM, Peck, Bot. Gaz. iii. 34. On *Lactuca pulchella* at Gato, N. Mex., 8 June; n. 6.

Æcidium Hydrophylli, Peck. Near Pagosa Peak, Colo., at 9,000 feet, 3 Aug., on *Hydrophyllum*; n. 7.

ÆCIDIUM PHLOGIS, Ell. & Ev. Bull. Torr. Club, xxiv. 284. At Aztec, N. Mex., 2 May, and at Los Pinos, Colo., 18 May, on *Phlox*; n. 8.

Æcidium Prenanthis, Pers. At about 9,000 feet, near Pagosa Peak, on *Helenium Hoopesii*; n. 9.

Æcidium Sommerfeltii, Johans. Near Pagosa Peak, 15 Aug., on *Thalictrum*; n. 11.

GYMNOSPORANGIUM, sp. At Pagosa Springs, 28 July (immature), on juniper; n. 81. These are conspicuous galls, somewhat like those of *G. globosum*, but probably not of that species. They are also quite different from either of those uncertain forms taken in 1898, of which some account is given in Pl. Baker. i. 19.

PHRAGMIDIUM OCCIDENTALE, Arthur, n. sp. I. Æcidia hypophyllous, round, often 1 mm. across, at first waxy, on pale-yellow spots: æcidiospores concatenate, orange-color, fading to pale-yellow, round-elliptical, prominently warty, 19–24μ broad, by 24–30μ long; paraphyses forming a border, incurved, colorless, nearly terete.

II. and III. Hypophyllous in tufted groups. Uredospores obovate, echinulate upon small papillæ, 18–22μ broad by 26–28μ long, pores about 8, scattered; teleutospores cylindric, nearly black, 5–7-septate, surface tuberculate, 85–110μ long; apex rounded, usually bearing a conical nearly colorless apiculation; pedicel nearly colorless, enlarged below, as long as, or by one-half longer than the spore.

Mountains near Pagosa Peak at 9,000 feet, on *Rulus Nutkanus*, 3 Aug.; n. 48. The same as the *P. Rubi-Idæi* of Pl. Baker. i. 20, that is, Baker, Earle & Tracy's n. 1043; and both these collections are chiefly æcidiums. The æcidium of this species with its warty spores is perfectly characteristic. It is Peck's *Lecythea speciosa* (afterwards transferred to *Uredo* by De Toni in Saccardo's *Sylloge*, vii. 860), which was collected by T. S. Brandegee more than twenty years since (Conf. Bot. Gaz. iii. 24), on *Rubus deliciosus*. The species was issued in Ellis & Everhart's distribution, n. 3425, on *Rubus Nutkanus*, from Sisson, Calif.

(W. C. Blasdale), and as n. 3246 on *R. deliciosus* from Rustic, Colo. (C. F. Baker). The original specific name is pre-occupied in the present genus (J. C. ARTHUR).

PHRAGMIDIUM SPECIOSUM, Fr. Syst. iii. 496. The Uredo only, on leaves and petioles of a wild rose, at Pagosa Springs, 21 July; n. 49.

PUCCINIA AGROPYRI, Ell. & Ev., Journ. Myc. vii. 131. At Hermosa, Colo., 1 April, on dead foliage of *Agropyrum tenerum*; n. 56.

Puccinia Epilobii, DC I & II, on on *Epilobium*, at Pagosa Springs, 18 July; n. 57. III on dead stems of *Epilobium*, at Hermosa, Colo., 30 March.

Puccinia Gayophyti, Billings. At Pagosa Springs, 22 July, on *Gayophytum*; n. 58.

PUCCINIA MIRABILISSIMA, Peck, Bot. Gaz. vi. 226. Hermosa, Colo., on *Berberis nana*, in March; n. 60.

PUCCINA TARAXACI, Plowr. Brit. Ured. 186. At Piedra, Colo., 14 July, on *Taraxacum officinale*; n. 59. Baker Earle & Tracy's n. 57 is of this species, though in Pl. Baker. i. 21, it is referred to *P. Hieracii*, and was so distributed.

PUCCINIA RHAMNI, Wettst. Verh. Zool-Bot. Wien. (1885), 545. Æcidia on leaves and twigs of *Rhamnus Smithii* at Pagosa Springs, 28 July; n. 10.

PUCCINIA STIPÆ, Arth. Bull. Iowa Coll. (1884) 160. Hermosa, 3 April, on dead leaves of *Oryzopsis*; n. 61. Some specimens of this went out to subscribers named as a new species.

PUCCINIA SUBSTERILIS, Ell. & Ev. Bull. Torr. Club, xxii. 58. Chama, N. Mex. 8 Sept. on *Stipa*; n. 122.

Uromyces Eriogoni, Ell. & Hark. Pagosa Springs, 26 July; n. 85.

Uromyces Euphorbiæ, C. & P. I & II, on *Euphorbia*, at Pagosa Springs, 28 July (no number given. E. L. G.).

Uromyces Glycyrrhizæ, Mag. II, on *Glycyrrhiza lepidota*, at Pagosa Springs, 28 July; n. 86.

UROMYCES LUPINI, B. & C. N. Pacif. Exp. n. 133. At Hermosa, Colo., 28 March, on dead leaves and stems of some lupine; n. 87.

UROMYCES ZYGADENI, Peck, Bot. Gaz. vi. 239. Los Pinos, Colo., 18 May, on *Zygadenus*; n. 88.

POLYPORACEÆ.

By L. M. Underwood.

POLYPORUS APPLANATUS, Wallr. Kr. Fl. ii. 591. On birch at Los Pinos, 30 May; n. 54.

POLYPORUS ELLISIANUS, Anders. Bot. Gaz. xvi. 113. On trunks of *Lepargyrea argentea*, at Aztec, N. Mex., 11 April; n. 55. Not often collected. Anderson's types, which are at Columbia University, are older, and stratose with many layers.

LYCOPERDACEÆ.

ASTRÆUS STELLATUS, Fisch. in Engl. & Prantl, Lief. 193, p. 341=*Astræus hygrometricus*, Morgan. On the ground in the edge of scrub-oak thickets at Hermosa, Colo., 29 March; n. 13.

HELOTIACEÆ.

DASYSCYPHA ALLANTOSPORA, n. sp. Ascocarps sessile, scattered or somewhat gregarious, cup shaped when moist, becoming sphaeroidal by the closing of the margin when dry, abundantly clothed above with long, straight, agglu-

tinated, continuous hairs 3–4μ in diameter, roughened and nearly black below, disc pale ochraceous, about 1mm.: asci clavate-cylindric, stipitate, thin walled, about 70–80x8μ; paraphyses slender, thread like, minutely guttulate: ascospores distichous or inordinate, hyaline, cylindric, curved, ends obtuse, 18–20–4μ.

On old decorticated twigs of *Cratægus rivularis*, Los Pinos, Colo., 30 May; n. 25. Also on decorticated twigs of *Rhus trilobata*, Hermosa, Colo., Apr. 9, and on *Fendlera rupicola*, Hermosa, Apr. 4.

The disc is completely hidden when dry by the drawing down of the margin with its vestiture of bright orange-red hairs. It is a handsome and well marked species.

Dasyscypha Bakeri, n. sp. Ascocarps thickly scattered, superficial, sessile, short cylindric or cup shaped when moist, contracted to subsphaeroidal when dry, small $\frac{1}{4}$–$\frac{1}{3}$mm., clothed externally with crisped, roughened, usually continuous and simple, fuscous hairs 100–200x3μ, substance of peridium delicate, of closely packed parallel thin walled thread like cells about 2μ in diameter, disc pure white, margin of short white teeth erect or spreading when wet, incurved when dry: asci cylindric, substipitate, 60–80x6μ; paraphyses thread like: ascospores distichous, narrowly oval, ends subacute, hyaline, continuous, about 12x3μ.

On dead stems of *Corydalis Brandegei*, near Pagosa Peak, Colo., 10,000 feet, 29 Aug.; n. 128.

Hymenoscypha (Phialea) cyathoidea, Phill. Brit. Disco. 140. Same habitat and same host as the last, also on *Veratrum*, at same locality and date; n. 128 in part.

Lachnella rhoina, n. sp. Ascocarps 1–2mm. when moist, $\frac{1}{2}$–1mm. when dry, at first partially buried in the wood fibres of the matrix, soon nearly superficial, black, composed of

loosely connected, thick walled, dark brown cells that are about 12x8μ, thickly clothed throughout with continuous, light cinnamon or orange brown, heavily roughened, somewhat crisped hairs, about 150–200x4μ, margin partially open when moist disclosing the salmon or orange disc, closely inrolled and covering the disc when dry; asci cylindric, short stipitate: paraphyses thread like, ends not thickened, about equalling the asci; ascospores subdistichous, cylindric-fusoid, at length faintly uniseptate, hyaline or slightly tinted, 8–10x3μ.

On decorticated branches of *Rhus trilobata*, Hermosa, Colo., 1 Apr.; n. 31. This is near *L. rhizophylla* E. & E. Proc. Philad. Acad. (1894); 348, but disagrees with the description there given in its somewhat larger size and slightly smaller spores, but more particularly in the cinnamon-brown of the crisped, continuous hairs and in the orange disc. In the latter species the color is "dirty white," the hairs are septate, and the disc has "no shade of yellow."

Mollisiaceæ.

Niptera(?) coccinea, n. sp. Scattered or gregarius; ascocarps irregular saucer shaped, $\frac{1}{3}$–$\frac{1}{2}$mm., soft, thin, subgelatinous, bright vermilion throughout or sometimes the margin bordered by a lighter nearly white line: asci oval, crowded, 40–50x4–6μ; paraphyses thread like, indistinct, scarcely exceeding the asci and not forming and not forming an epithecium; ascospores subcylindric, hyaline, once septate, not constricted, about 8x3μ.

On dead stems of *Corydalis Brandegei*, near Pagosa Peak, Colo., 10,000 feet, 29 Aug.; n. 178 in part. The ascocarp is exceedingly thin and delicate and the hypotheceum is scantily developed.

PATELLARIACEÆ.

CALDESIA SABINAE (De Not.) Rehm. Eng. & Prantl, i. 1. 223.=*Karskia sabinæ* Rehm. Sacc. Syl. viii. 781. On shredded bark of *Juniperus*, Hermosa, Colo., 28 March; n. 16. This has not been before reported from America. The asci are 100x40μ and the spores 40x18μ. The asci are 8-spored as figured in Eng. & Prantl. l. c., not 4-spored as given by Saccardo.

KARSCHIA OCCIDENTALIS, n. sp. Ascocarps black, sessile, discoid, the base sunken in the matrix, margin short, inconspicuous, disc black, rugose, plane or somewhat convex, about $\frac{1}{2}$mm.; asci crowded, cylindric, about 40–50x8–10μ; paraphyses exceeding the asci, the tips indistinguishably blended in a dense epithecium; ascospores subdistichous, oval, brown, slightly curved, uniseptate, not constricted, about 12x6μ.

On barkless weather-worn branches of *Juniperus*, Hermosa, Colo., Apr. 3, (no number given. E. L. G.). Some minute flecks of lichen thallus were observed on the same twigs but they seemed to have no connection with the fungus.

MELASPILEA EMERGENS, RHEM.? Disc. 363. *Glonium emergens*, Duby. Hyst. i. 36.

On decorticated, weather-worn twigs of *Cercocarpus*, Hermosa, Colo., March 29. On *Amelanchier*, Hermosa, March 30. On *Quercus*, Durango, March 23, and Hermosa, Mch. 28. On *Fendlera rupicola*, Hermosa, Apr. 4, (no numbers given. E. L. G.).

This species has not been heretofore reported from this country, and we have seen no authentic specimens; but the material answers well to published descriptions.

Patinella Crandallii Sacc. On *Sieversia turbinata*, near Pagosa Peak, 11,500 feet, 6 Aug.; n. 44.

TRYBLIDIACEÆ.

HETEROSPHAERIA FENDLERAECOLA, n. sp. Ascocarps thickly scattered, at first buried, becoming erumpent or subfree, closely sessile, dark brown, almost black, coriaceous, cup shaped, about ½–1mm., the epithecium at first covered by a membrane that soon splits stellately into about 20 marginal teeth that are erect, exposing the epithecium when moist but closed down over it when dry; epithecium dark brown; asci 50–60x5μ, cylindric-clavate, embedded in the numerous paraphyses that unite above in a well marked epithecium; ascospores distichous or inordinate, spindle shaped, hyaline, somewhat unequally uniseptate, 8–10x2–3μ.

On dead weather-worn twigs of *Fendlera rupicola*, Hermosa, Colo., April 4, (no number given. E. L. G.).

TRYBLIDIOPSIS OCCIDENTALIS, n. sp. Ascocarps scattered, at first buried, then prominently emergent and almost free, sessile, black, dull, somewhat rugose, long closed, at length irregularly or stellately dehiscent exposing the dark brown disc, from ½–1mm. in diameter; asci broadly oval, thick walled, about 100x25–30μ; paraphyses greenish, much exceeding the asci, branched and interwoven above into a dense epithecium; tips scarcely swollen; ascospores broadly oval, ends rounded, uniseptate, at first hyaline and surrounded by a gelatinous envelope that is thickest at the septum, finally loosing this coating and becoming dark brown and somewhat constricted, about 30x18μ.

On the smooth bark of dead twigs of *Juniperus*, Hermosa, Colo., April 3. This is the first species of this well marked genus to be detected in this country.

TRYBLIDIUM OCCIDENTALE, n. sp. Gregarious, often crowded; ascocarps Patellaria-like, at first somewhat sunken in the matrix, then free, black, subrugose, about ½mm.

wide, flat, sessile, long closed but finally exposing the orbicular, rugose, dull black disc, margin inconspicuous; asci 80–100x20μ, thick walled; paraphyses numerous, thread like, united above in a thick epithecium; ascospores distichous, ovoid, ends obtuse, about 5 septate, somewhat constricted, part or all of the cells longitudinally divided, hyaline or probably at length brownish, about 30x10μ.

Common on decorticated twigs of *Amelanchier*, *Cercocarpus*, *Quercus* (n. 14), *Rhus*, and *Salix* (n. 15), Hermosa, Colo. March and April, 1899. Often associated with *Lophium leptothecum* and *Melaspilea emergens*. Issued as *Blitridium rhois* n. sp.

HYSTERIACEÆ.

HYSTEROGRAPHIUM BAKERI, n. sp. Blackening the substratune; ascocarps gregarious, often crowded, dull black, superficial, subcylindric, ends obtuse, lips at first firmly closed forming a slightly elevated ridge, at length sometimes slightly parted but not exposing the disc, usually laterally longitudinally striate, $\frac{1}{2}$–1mm. x about $\frac{1}{3}$mm.; asci subcylindric, exceeded by the thread like paraphyses, about 80x12μ; ascospores distichous, variously elliptic or subcylindric, usually 5–7 septate, slightly constricted, one or more of the medial cells once vertically or obliquely divided, ends narrowed but obtuse, light brown, 20–22x6μ.

On decorticated wood of *Cercocarpus*, Hermosa, Colo., March 28.

HYSTEROGRAPHIUM INCISUM, E. & E. Bull. Torr. Club, xxiv. 462. On dead twigs of *Peraphyllum*, Durango, March 19. On *Amelanchier*, Hermosa, March; n. 30.

HYSTEROGRAPHIUM, sp. On *Quercus*, Durango, March 27. A small specimen insufficient for full determination; probably new.

LOPHIUM LEPTOTHECUM, n. sp. Scattered or gregarious: ascocarps erect, elongate, compressed, the base sunken in the wood fibers, black, brittle, carbonaceous, roughened by transverse striations, black and shining within, lips thin, closely compressed, 1–1½mm. high, about ½mm. broad with the sides nearly parallel or slightly tapering upward, about ½mm thick; asci numerous, very long, 400–500x6μ; paraphyses abundant, threadlike, very slender, less than 1μ thick, not conspicuously branched; ascospores dark-brown equalling the ascus, about 2μ thick, conspicuously and closely septate, the cells 2–3μ long, when freed from the ascus usually breaking into pieces, 12–16 feet long.

On barkless dead twigs of *Amelanchier* (n. 83), and *Quercus* and *Rhus* (n. 84) at Hermosa, Colo., March. Ellis records doubtfully three species of this genus as occurring in North America. The first seems to have been a case of mistaken identification; and of the two Schweinitzian species he is unable to give any account of the asci and spores. This new one seems therefore to be the first fully authentic member of this genus to be found in America.

ERYSIPHACEÆ.

ERYSIPHE POLYGONI, DC. Fl. Fr. ii. 273. At 9,000 feet, near Pagosa Peak, 18 Aug., on *Lathyrus* (n. 29), and on dead stems of a lupine, at Hermosa, 28 March (n. 80); also at Pagosa Springs, 28 July, on *Thermopsis*; n. 79.

MICROSPHÆRIA DIFFUSA, C. & P. Journ. Bot. ii. 1. 13. *M. Symphoricarpi*, Howe, acc. to Salmon in Mem. Torr. Club, ix. 161. Near Pagosa Peak at 9,000 feet, 30 Aug., on leaves of *Symphoricarpus*; n. 36.

HYPOCREACEÆ.

ALLANTONECTRIA, gen. nov. Perithecia as in *Nectria*; ascospores allantoid, 1-celled, cylindric, curved, hyaline.

ALLANTONECTRIA YUCCÆ, n. sp. Densely cespitose, 12–20 or more perithecia united on a stroma; stromatic clusters erumpent, thickly scattered or subconfluent, average size about 1mm.; perithecia bright-red, becoming dark dull-red when dry; globose, smooth or slightly roughened, collapsing, 100–125μ; asci 8-spored, clavate, minute, aparaphysate (?), about 20–30 x 3–4μ; ascospores distichous or inordinate, minute, 4–5 x $\frac{3}{4}$–1μ.

On dead, withered leaves of *Yucca*, at Hermosa, 28 March; n. 12.

DOTHIDEACEÆ.

DOTHIDEA CONSPICUA, Griff. Bull. Torr. Club, xxvi. 442. At Hermosa, 30 March, on dead leaves of *Yucca*; n. 28.

SORDARIACEÆ.

By David Griffiths.

DELITSCHIA FURFURACEA, Niessl. in Sacc. Syll. ix. 747. Hermosa, 28 March, on excrement of donkeys; n. 26.

HYPOCOPRA EQUINA, Sacc. Syll. i. 247. With the last, and same date, on horse-dung.

HYPOCOPRA MERDARIA, Fr. Elench. ii. 100. With the two foregoing (no numbers assigned for these. E. L. G.).

SORDARIA FIMICOLA, Ces. & De Not. Schem. 52. With *Delitschia furfuracea.*

SPHÆRIACEÆ.

ROSELLINIA PARASITICA, Ell. & Ev. Proc. Philad. Acad. (1890) 227. On dry barkless twigs of *Symphoricarpus* at Durango, 18 March; n. 64.

ROSELLINIA PULVERACEA, Fckl. Symb. 149. At Durango on dead stems of *Chrysothamnus*, 23 March. Specimens in the main at agreement with other western ones that have

been referred here; but the asci are only 60–80x6μ, and the ascospores 8–10x4–5μ which is smaller than the measurements usually given. In Durango specimens on oak, and others from Hermosa, the perithecia are superficial, or nearly so, but seem partially buried by the fine fibrous shreds of the weather-worn wood.

Rosellinia subcompressa, Ell. & Ev.? Bull. Torr. Club, xxiv. 177. On barkless wood of poplar, at Hermosa, 1 April; n. 65. In the absence of authentic specimens for comparison these are so named with some doubt, though they agree with the short description given.

Cucurbitariaceæ.

Cucurbitaria Berberidis, S. F. Gray, Nat. Arr. i. 519. Durango, 19 March, on dead twigs of *Berberis Fendleri*.

Otthia Clematitis, n. sp. Perithecia crowded or occasionally scattered, dull-black, carbonaceous, rugulose, about $\frac{1}{2}$ mm. in diameter, ostiole perforate, slightly sunken, seated on a thin crust-like black stroma that remains after the breaking down of the perithecia, developing under the cuticle but exposed by its rupturing and breaking away, by confluence sometimes forming linear masses several cm. in length; asci paraphysate, subcylindric, 90–120x16–20μ; ascospores inordinate, oval, ends subacute, slightly constricted, often somewhat curved, about equally uniseptate, light brown, about 40x8μ.

On dead and decaying bark of *Clematis ligusticifolia*, Durango, 19 March; n. 41. Most of this material is too old The species should be collected in autumn. On some stems the perithecia are mostly scattered so that it might be taken for a *Didymosphæria*. In other cases they are densely cespitose and seated on an evident stroma.

Otthia Fendleraecola, n. sp. Perithecia buried, then partially erumpent, densely crowded in one or two rows and bursting through the bark in long linear masses, 6 or 8 to 20 or more together, often flattened by mutual pressure, dark brownish black, conspicuously rugose, large, $\frac{1}{3}$–$\frac{2}{3}$ mm., ostioles, perforate, depressed; asci cylindric, about 100x18μ; paraphyses thread like; ascospores monostichous or partly distichous, light brown, fusiform, ends acutish, uniseptate, not constricted, about 25x6μ.

On dead and dry but not barkless twigs of *Fendlera*, at Hermosa, 4 April; n. 42.

Otthia Distegiæ, Tracy & Earle, Pl. Baker. i. 29. Durango, 20 March; n. 43, on the same host as the original specimens, namely, Baker, Earle & Tracy's n. 1090.

Amphisphæriaceæ.

Strickeria Amelanchieris, n. sp. Perithecia scattered or somewhat gregarious, black, smooth, thin walled, strongly collapsing, about $\frac{1}{3}$ mm, ostioles indistinctly perforate, not prominent; asci clavate-cylindric, about 100x16μ; paraphyses thread like, abundant; ascospores subdistichous, irregularly oval, often curved, 5–7-septate, one or more of the medial cells once vertically divided, constricted at the middle septum and often slightly so at the others, somewhat flattened, about 30–35x10x7μ.

On decorticated twigs of *Amelanchier*, Hermosa, Colo., 30 March; n. 69.

This is much like *S. Fendleræ* externally, but it has very different spores.

Strickeria Cercocarpi, n. sp. Blackening the wood; perithecia with the base sunk in the matrix, scattered or cespitose in clusters of 3 or 4, black, rugose, not shining, a

length slightly collapsing above, about ½mm., ostiole minutely papillate, rather inconspicuous; asci cylindric, short stiped, about 100x10μ; paraphyses very numerous, thread like, exceeding the asci; ascospores monostichous, oval to ovate, dark brown, at length 7-septate, with most of the cells once or twice vertically divided, constricted at the middle septum, ends often somewhat unequal, obtuse or subacute, 20–25x8μ.

On old decorticated branches of *Cercocarpus*, at Hermosa 28 March.

STRICKERIA FENDLERÆ, n. sp. Perithecia scattered or gregarious, black, shining, thin walled, collapsing to patelloid, 200–300μ; asci cylindric, thick walled, 80–100x20μ; paraphyses thread like, abundant; ascospores distichous, oblong, ends obtusely rounded, 4 septate, one or more medial cells vertically divided, hyaline, at length very light brown, 25–30x10μ.

On barkless weather-worn twigs of *Fendlera rupicola*, Hermosa, 4 April.

This species is well marked by the strongly collapsed perithecia that look like a minute saucer-shaped *Patellaria* and by the nearly hyaline spores.

STRICKERIA POPULI, n. sp. Perithecia scattered, black, shining, the largest ½mm. in diameter, subglobose, at length slightly collapsed or indented above, ostioles simply perforate; asci about 80x16μ; ascospores monostichous, at first yellowish and uniseptate, becoming brown and 3-septate, constricted at each septum, one or both medial cells vertically divided, ends obtuse, about 18–20x8–10.

On decorticated, weathered twigs of *Populus angustifolia*, Durango, 21 March; n. 68.

This is near *S. insecura*, but differs in the shining, par-

tially collapsing perithecia and in the smaller asci and spores. The spores do not seem in any case to be more than 3-septate while in the latter species they are often 5- and even 7-septate as seen in N. A. F. n. 882 and in Baker, Earle & Tracy, n. 1059.

STRICKERIA RHOINA, n. sp. Perithecia thickly scattered, bases deeply buried, dull black, ½–¾ mm., at length collapsing, ostioles minutely papillate, often obscure; asci cylindric, short-stipitate, about 100–120x10μ; paraphyses numerous, thread-like, exceeding the asci; ascospores strictly monostichous, ovate, yellow or light-brown, at first 3–4-septate, becoming 5–7-septate, one or more medial cells once vertically divided, slightly constricted at the middle septum, about 20x8μ.

On decorticated wood of *Rhus trilobata*, Hermosa, March 29. The asci and spores are much as in *Teichospora rhypodes* on *Rhus* from Michigan, but the perithecia are twice the diameter, strongly collapsing, and lack the "conic-papilliform" ostiolum of that species.

STRICKERIA, sp. On decorticated *Salix*, Hermosa, March 28. The specimens are too old for satisfactory identification. The spores are 7-septate, 35x15μ.

STRICKERIA, sp. On *Quercus*. Same place and date; not in condition to be determined.

TREMATOSPHÆRIA CHRYSOTHAMNI, n. sp. Perithecia scattered or somewhat closely gregarious in small groups, black, shining, carbonaceous, nearly spherical but the top slightly flattened, not collapsing, about ¼mm., ostiole minutely papillate; asci clavate, 70–80x8–10μ; paraphyses numerous, filiform, yellowish; ascospores distichous, light-brown, somewhat fusiform, often curved, 2–4-septate, somewhat constricted at the septa, 16–20x4–5μ.

On decorticated stems of some *Chrysothamnus*, Hermosa, 4 April; n. 70.

TREMATOSPHÆRIA FENDLERÆ, n. sp. Scattered or gregarious on more or less blackened areas; perithecia prominent, conic-mammellate, dark brownish black, roughened toward the base, carbonaceous, not collapsing, ½mm. or more in both height and diameter; asci subcylindric, thin-walled, about 60–80x18μ; paraphyses abundant, filiform; ascospores normally distichous but often obliquely monostichous or inordinate, narrowly oval, somewhat curved, dark-brown, 3-septate, scarcely constricted, about 20–25x6μ.

On decorticated twigs of *Fendlera*; same place and date as the last.

TREMATOSPHÆRIA LUPINI, n. sp. Perithecia scattered, black, carbonaceous, free, with base slightly sunken, spherical or somewhat vertically elongated, about ¼–⅓mm., ostiole scarcely papillate, perforate, the top of the perithecium finally breaking in but not collapsing; asci numerous, clavate-cylindric, short-stipitate, about 80x8μ; paraphyses filiform, abundant; ascospores distichous or inordinate, slender, pointed, light brown, 5–7-septate, 30–40x4μ.

On old stems of *Lupinus*, Hermosa, 28 March; n. 71.

LOPHIOSTOMATACEÆ.

LOPHIOTREMA CERCOCARPI, n. sp. Perithecia closely gregarious on extended blackened areas, dull-black, conical, the base sunk in the matrix, ostioles conspicuously conic-papillate, compressed, opening by a slit; asci clavate, thin-walled, about 80–100x12–15μ; paraphyses abundant, filiform, exceeding the asci; ascospores distichous, fusoid-falcate, ends acute, not appendaged, 3–5-septate, slightly constricted, each cell with a conspicuous large central gutta, hyaline or faintly olivaceous, about 35x8μ.

On dead barkless wood of *Cercocarpus*, Hermosa, 28 March.

PLATYSTOMUM HYSTERIOIDES, n. sp. Perithecia scattered, elongate, about 1x½mm., rough, dull-black, the base often clothed by clinging wood fibres, ostioles inconspicuous, at length opening by a crack or chink; asci cylindric, short-stipitate, 100–140x12μ; paraphyses filiform, abundant; ascospores ovoid, 3-septate, constricted at middle septum, ends somewhat unequal, one or both medial cells once vertically divided, light-brown, becoming dark-brown and opaque at full maturity, about 20x10μ.

On decorticated *Amelanchier*, Hermosa, 30 March; n. 75; also on *Fendlera*, Hermosa, 4 April.

PLATYSTOMUM SALICUM, n. sp. Perithecia scattered, at first buried then emergent, black, shining, elongate, ¾–1mm. long by about half as wide, ostioles perforate, usually slightly sunken, longer than wide; asci clavate, thick-walled, 80–100x16μ; paraphyses abundant, filiform; ascospores subdistichous, 5- or occasionally 7-septate, slightly constricted at middle septum, ends subacute, often curved, one or two cells vertically divided, the divided cells usually somewhat enlarged, light-brown, at length dark and opaque, 30–35x7–8μ.

On dead barkless willow twigs at Hermosa, 30 March.

SCHIZOSTOMA CERCOCARPI, n. sp. Developing under the bark which falls away, exposing extensive black crust-like areas; perithecia oval, about ⅓x¼mm., black, scarcely shining, densely crowded, often a little confluent, seated on a thin black stromatic crust, ostioles inconspicuous consisting of an obscure compressed ridge extending for three-fourths the length of the perithecium; asci linear-cylindric, abundantly paraphysate, about 80x6μ; ascospores mono-

stichous, fusiform, uniseptate, constricted, light olivaceous brown, about 16–18x4μ.

On dead, but not weather-worn branchlets of *Cercocarpus* at Hermosa, 28 March.

Mycosphærellaceæ.

Mycosphærella delphiniicola, n. sp. Perithecia aggregated on irregular blackened spots, nearly spherical, black, 100–150, ostioles inconspicuous, seated on irregularly anastainosing mycelial threads beneath the epidermis and coming away with it; asci aparaphysate, clavate, clustered, 40–60x6–8μ; ascospores distichous, narrowly oval, ends acutish, hyaline, uniseptate, not constricted, about 12x3μ.

On dead stems of *Delphinium*, near Pagosa Peak, 10,000 feet, 29 Aug.; n. 37.

Mycosphærella Pentstemonis, n. sp. Perithecia rather densely aggregated on irregular blackened areas, black, nearly spherical, of coarse cellular structure, about 150–200μ in diameter, seated on a brown, much branched, frequently septate mycelium of very large brown threads 10–12μ thick, the branches slenderer; asci aparaphysate, clustered, clavate, about 60x12μ; ascospores distichous or inordinate, ovate, hyaline, often guttate, unequally uniseptate, constricted, about 25x6μ.

On dead leaves and stems of *Pentstemon*, near Pagosa Peak, 10,000 feet, 29 Aug.; n. 38.

Mycosphærella phlogina, Earle. *Sphærella phlogina* E. & E. Journ. Myc. iv. 65. On dead leaves of *Gilia Nuttallii*, near Pagosa Peak, 11,000 feet, 12 Aug.; n. 39.

Mycosphærella, sp. On dead stems of *Sedum rhodanthum*, near Pagosa Peak, Aug. 29. Mostly sterile.

MYCOSPHÆRELLA sp. On dead stems of *Senecio* near Pagosa Peak, 10,000 feet, 29 Aug.; n. 40.

PLEOSPORACEÆ.

LEPTOSPHÆRIA DOLIOLUM (Pers.) De Not. Schem. Sfer. 61.

On dead stems of *Heracleum*, near Pagosa Peak, 10,000 feet, 29 Aug.; n. 32.

LEPTOSPHÆRIA LUPINICOLA, n. sp. Perithecia thickly scattered or gregarious, buried but becoming exposed by the shredding of the epidermis, black, somewhat roughened, not collapsing, ostioles strongly papillate, 200–250μ; asci subcylindric, thin walled, about 80x8μ; paraphyses threadlike; ascospores subdistichous, cylindric, curved, light olivaceous, 3-septate, cells uniform, not constricted, 25–30x4μ.

On dead lupine stems, Hermosa, 4 April; n. 82. This seems to be sufficiently distinct from any of the many species attributed to papilionaceous hosts.

LEPTOSPHÆRIA TYPHÆ Karst. (?) Myc. Fenn. ii. 99.

On dead stems of *Typha*, at Hermosa, 30 March; n. 33.

This differs materially from all other specimens of *Leptosphæria* found on *Typha* in this country in the decidedly smaller spores and narrower asci. Our specimens have the asci about 60x12μ and the spores only 20x5μ, while in specimens of *L. typharum* (Desm.) Karst. the asci are 60–80x20μ, and the spores 25–30x7–8μ. Our measurements of perithecia asci and spores agree closely with those published for *L. Typhæ*, but in our specimens the perithecia are often densely cespitose in clusters of 6 or 8 to 20 forming double or single lines and not "scattered" as described for the European specimens.

LEPTOSPHAERIA VERATRI, n. sp. Perithecia scattered, buried except the strongly papillate ostioles, $\frac{1}{4}$–$\frac{1}{3}$mm., of

large, loose-celled parenchyma, the cells 8–10μ in diameter and arranged somewhat radially; asci clavate, substipitate, about 100x10μ; paraphyses abundant, filiform; ascospores subdistichous, light-yellowish, 3-septate, much constricted, ends rounded, one of the medial cells usually slightly enlarged, 20–25x5μ.

On dead, weathered stems of *Veratrum*, near Pagosa Peak, 10,000 feet, Aug. 29. The perithecia are finally exposed by the falling away of the weathered epidermis giving some of the older specimens the aspect of a *Trematosphaeria*.

PLEOSPORA AUREA, Ell. Bull. Torr. Club, x. 53, and N. A. Pyrenomycetes 340, not of Tassi. Atti. R. Acc. Siena, 1896. On dead stems of *Ligusticum*, near Pagosa Peak, 10,000 feet, 23 Aug.; n. 50.

PLEOSPORA COMPOSITARUM, n. sp. Perithecia scattered, buried, flattened, black, about 200μ, membranous, of firm cellular parenchyma, cells small, 4–8μ, fringed at base with short mycelium strands; asci oval to ovate, short-stipitate 80–90x20μ; paraphyses abundant, exceeding the asci; continuous but conspicuously guttulate, tips slightly swollen and sometimes vaguely branched; ascospores distichous, brown, irregularly oval to ovate, ends obtuse, 5- (occasionally 6–7-) septate, conspicuously constricted at the middle septum and often somewhat curved, medial cells usually once vertically divided, end cells entire, 20–25x8–10μ.

On dead stems of *Eucephalus*, at Hermosa, 30 March; n. 76. This is smaller throughout than *P. herbarum* and the spores are usually only 5-septate. It agrees quite closely with the description of *P. vulgaris* Niesse., as given by Ellis, N. A. Pyr. 339, but the spores are quite different from those figured by Berlese in his Monograph Pl. 2 fig. 6 for *P. infectoria* Fckl. to which species he reduces *P. vulgaris*.

PLEOSPORA HERBARUM (Pers.) Rabh. in Sacc. Syll. ii. 247. On dead stems of *Lupinus*, Hermosa, March 28, and of *Erigeron flagellaris*, Hermosa, 4 April, n. 51. This seems to be the typical form of a widely dispersed species.

PLEOSPORA LEPIDIICOLA, n. sp. Perithecia abundant, scattered, buried, the papillate ostioles alone protruding, black, 200–300μ in diameter; asci very numerous, subcylindric, short-stipitate, 100–120x20μ; paraphyses numerous, filiform; ascospores subdistichous, ovate, ends broadly rounded, light-brown, 7-septate, much constricted at middle septum, ends somewhat unequal, each section three or more times vertically divided, the vertical septa sometimes continuous for half the length of the spore, sometimes interrupted, about 20–28x10–11μ.

On dead stems of *Lepidium apetalum*, Hermosa, 30 March; n. 52.

This approaches some of the smaller spored forms that have been referred to *P. herbarum*. By some it would doubtless be considered as belonging to that composite species to which has been referred material from all the continents and on hosts belonging to most of the larger families of flowering plants. Such mixing of things can serve no good purpose in classification.

A number of fuscous mycelial threads are usually to be seen adhering to the base of the perithecium, but there are no bristles about the ostiolum as in the closely related genus *Pyrenophora*.

PLEOSPORA PERMUNDA (Cke.), Sacc. Syll. ii. 243. On dead stems of some composite, near Pagosa Peak, Aug. 29; n. 53. The spores are rather large for this species, measuring 30x12μ.

PLEOSPORA SENECIONIS, n. sp. Perithecia scattered, buried,

becoming exposed by the shredding away of the weathered tissues of the host, black, small, 200μ or less, collapsing to saucer-shape, of soft loose-celled panachyma, the cells about 10μ in diameter, ostioles inconspicuous; asci oval, nearly sessile, about 80x18μ; paraphyses scanty, filiform, slender, continuous; ascospores subdistichous, ovate, ends rounded, brown, 5–7-septate, each cell usually once vertically divided, slightly constricted at middle septum, medial cells usually much shorter than the end cells, covered at least when young with a hyaline mucous coating 1–4μ thick, 20–30x12μ.

On dead stems of *Senecio*, Hermosa, 28 March. Much like forms that have been referred to *P. vulgaris*, Niessl. It also resembles what is described above as *P. compositarum*, but differs in the softer large-celled wall of the perithecium, and in the septation and mucous coating of the spores.

Pyrenophora Castilleiæ, n. sp. Perithecia scattered, black, buried, becoming exposed by the shredding of the epidermis, 150–200μ, collapsing, covered throughout with crisped, fuscous hairs, 40–100x4μ, these at length deciduous above but remaining as a vestiture below, ostiole perforate, scarcely papillate; asci, oval to ovate, about 80x30μ; paraphyses filiform, exceeding the asci; ascospores distichous or inordinate, oval, 5–7-septate, each cell 2–3 times vertically divided, when young yellow and constricted uniseptate, at maturity dark-brown and scarcely at all constricted, 25–30x10–12μ.

On dead stems of *Castilleia*, Hermosa, April 5. Resembles *P. Eriogoni*, following, but differs in the smaller collapsing perithecia and the shorter partially deciduous vestiture. The asci, too, are shorter and the spores are not constricted at maturity.

Pyrenophora clematitis, n. sp. Perithecia black, buried

or finally exposed, about 150–175μ, beset by a few rather stiff brown hairs or bristles about 30–50μ long, strongly collapsing, ostiole conspicuously papillate; asci oval or ovate, 80–90x20–25μ; paraphyses filiform; ascospores distichous, oval, 5–7-septate, some or all of the cells once or twice vertically divided, slightly but plainly constricted at all the septa, from yellow to brown, finally becoming very dark and opaque, and seeming somewhat shrunken, 20–30x 12–15μ.

On dead stems of *Clematis ligusticæfolia*, at Hermosa, 1 April.

Pyrenophora Eriogoni, n. sp. Perithecia buried, becoming exposed by the shredding of the bark, scattered, dark-brown, about ¼mm., clothed throughout with somewhat crisped, spreading, occasionally septate hairs that are 80–150x4μ in length, dark-fuscous at base but nearly hyaline at the tip, ostiole inconspicuous, slightly depressed but not collapsing; asci cylindric, thick walled, about 120x 25μ; paraphyses numerous, filiform; ascospores ovate, ends obtusely rounded, bright-brown, 7-septate, constricted at the middle septum, ends unequal, all the cells 2–4 times vertically divided, about 25–30x12μ.

Hermosa, 3 April, on dead stems of *Eriogonum*; n. 62. The asci and spores are much as in some forms of *Pleospora herbarum*, but the species is easily distinguished by its vestiture of crisped brown hairs.

Valsaceæ.

Diaporthe crinigera, Ell. & Ev. Proc. Philad. Acad. (1890) 234. Hermosa, 29 March, on bark of the larger branches of oak.

Valsa boreella, Karst. At Hermosa, 1 April, on dead

twigs of willow; n. 90; growing with *Cytospora boreella*, n. sp.

VALSA CERATOPHORA, Tul. Sel. Carp. ii. 191, t. 22. On dead stems of alder, at Durango, 20 March; n. 91. By the somewhat elongated ostioles, these specimens are more at agreement with Tulasius' figure than are most of the American material that has been referred to the species.

VALSA LEPARGYREÆ, n. sp. Stromata abundantly scattered, elevating the bark in conspicuous conical pustules; perithecia 12–20 or more in each stroma, buried with no circumscribing line, black, membranous, of cellular parenchyma the cells averaging about 10μ, necks long, the minute, smooth ostioles arranged in a circle about a brown erumpent disc nearly $\frac{1}{2}$mm. in diameter: asci delicate, 8 spored, nearly sessile, 40–50 x 6μ; ascospores continuous hyaline, slightly curved, ends obtuse, 12–16 x 3μ.

On dead branches of *Lepargyrea argentea*, Hermosa, April, 4; n. 92.

DIATRYPACEÆ.

DIATRYPE ALBOPRUINOSA (Schw.) Cke. Grev. xiii. 37. On dead branches of oak at Hermosa, 1 April; n. 27.

SPHÆROPSIDACEÆ.

CONIOTHYRIUM ERIOGONI, n. sp. Pycnidia minute, buried, black, thickly scattered, of loose-cellular parenchyma, cells 6–8μ in diameter, ostioles piercing the epidermis, about 80μ; sporules oval, light yellowish brown, about 6x4μ; sporophores not seen.

On dead stems of *Eriogonum umbellatum*, at Hermosa, 4 April; n. 19.

CONIOTHYRIUM PENTSTEMONIS, n. sp. Subsuperficial, without spots; pycnidia scattered, black, membranous, thin-

walled, scarcely ostiolate, 100–200μ; sporules oval or ovoid, continuous, dark-brown, about 7x5μ; sporophores not seen.

On dead leaves and stems of *Penstemon*, at Hermosa, 30 March; n. 20.

Cytospora boreella, n. sp. Stronea elevating the epidermis forming a truncated cone 1mm. in diameter at base and $\frac{3}{4}$mm. high; pycuidial cavities few, 2 or three to 5 or 6 in each stroma with ostioles united in a minute, emergent, black disc, usually crowned by a scanty reddish-orange gelatinous mass of exuded spores; sporules curved, hyaline, 6–8x1$\frac{1}{2}\mu$.

On dead willow twigs at Durango, March 19. Also at Hermosa, 6 April, with *Valsa boreella*; n. 23.

This seems to be the spermagonial stage of what has been called *Valsa boreella* Karst. A similar form on *Salix* from Kansas (N. A. F. No. 3447) has been called *Cytospora nivea*, but our specimens are certainly not connected with *Valsa nivea*. The exuded spore-masses are much the color of those of *C. chrysosperma*, but they are much less copious and do not take the form of a tendril. The spores too are slightly larger than in that species.

Cytospora Corni, West. Lamb. Fl. Belg. ii. 372. On dead twigs of *Cornus*, Durango, Colo., March 20; n. 24.

This agrees with N. A. F. No. 3448 on *Cornus asperifolia* from Kansas, which is named as above. The hard carbonaceous, frequently simple stroma indicates that it belongs in *Centhospora* rather than in *Cytospora*.

Phoma Coloradoensis, n. sp. Pycnidia scattered, rather prominent, but covered by the epidermis and coming away with it, black, lenticular, large, $\frac{1}{4}$mm. or more, of firm cellular parenchyma, the cells 8–10μ in diameter, ostiole papillate, at length broadly perforate; sporules cylindric,

straight or slightly curved, ends rounded, often minutely biguttate, 8–10x3–4μ; sporophores not seen.

On dead stems of *Pedicularis racemosa*, near Pagosa Peak, 6 Aug.; n. 45.

This was previously collected by Mr. Baker on *Pedicularis*, at Four Mile Hill, near Steamboat Springs in Northern Colo., July 22, 1896. It was referred by Ellis to the composite *P. herbarum*. It seems, however, to be sufficiently distinguished from that assemblage of forms by its larger, scattered and not gregarious hycindia. In this vast genus spore characters alone furnish an insufficient guide to the recognition of species.

PHOMA HERACLEI, n. sp. Pycnidia scattered, prominent, black, subglobose, not collapsing, about $\frac{1}{4}$mm., finally exposed by the shredding away of the thin epidermis, of firm cellular parenchyma, cells 4–6x6–8μ; shorules oval, hyaline, usually with a minute gutta near either end, about 8–10 x6μ.

On dead stems of *Heracleum lanatum*, near Pagosa Peak, 9,000 feet, 20 Aug.; n. 46.

PHOMA LUPINICOLA, n. sp. Thickly scattered on large, often slightly whitened areas; pycnidia long covered by the thin epidermis, black, prominent, subglobose, not collapsing, about 150–175μ, membranous, of distinctly cellular parenchyma, cells 6–12μ averaging 8μ in diameter, ostioles simply perforate, the opening about 20μ in diameter; sporules numerous, regularly oval or subcylindric, ends broadly obtuse, quite uniformly with a minute gutta at either end, about 8–10x4–5μ.

On dead lupine stems at Durango, 18 March; n. 47.

RHABDOSPORA GUTIERREZIAE, n. sp. Pycnidia scattered, buried but finally somewhat protruding through the thin,

whitened epidermis, 80 to 150μ, composed of loose, rounded cells about 8μ in diameter, ostioles inconspicuous; sporules straight or slightly curved, ends obtuse, at first continuous then 1–3 and finally multiseptate, the cells remaining united, 30–50x2–3μ.

On dead stems of *Gutierrezia*, Hermosa, 3 April; n. 77.

RHABDOSPORA SOLIDAGINIS, (C. & E.) Sacc. Syll. iii. 591. On dead stems of *Solidago*, Durango, March 22; also at Hermosa, 1 April; n. 63.

RHABDOSPORA UMBELLIFERARUM, n. sp. Occupying large areas; pycnidia scattered buried, papillate emergent, black, about 200–250μ, soft, of minute rounded cells about 3μ in diameter; sporules acicular, continuous, usually straight, about 35x1μ.

On dead stems of some large umbelliferous plant in a swamp at Hermosa, 6 April; n. 78.

SEPTORIA GAURINA, E. & K. Amer. Nat. Nov. 1883. On *Gaura*, Pagosa Springs, 22 July; n. 66. This species seems to have been omitted from Saccardo's *Sylloge*.

SEPTORIA OSMORRHIZÆ, Peck, Regent's Rep. xxxix. 46. On living leaves of *Osmorrhiza* near Pagosa Peak, 9,000 feet, 18 Aug.

SEPTORIA SYMPHORICARPI, E. & E. Journ. Myc. ii. 38. On living leaves of *Symphoricarpus*, near Pagosa Peak, 9,000 feet, Aug. 30; n. 67.

STAGONOSPORA CORNICOLA, n. sp. Pycnidia gregarious, in irregular clusters or scattered, buried in the cuticle, the short blunt ostioles finally erumpent, black, firm, smooth, about 200μ; sporules hyaline, at first continuous, finally fainly 3-septate, subcylindric, strongly curved, ends obtuse, about 16x3$\frac{1}{2}\mu$.

On yellowed dead twigs of *Cornus*, at Durango, 20 March. Conspicuous from the yellowed cuticle containing the thickly scattered perithecia which come away with it.

Melanconiaceæ.

Coryneum umbonatum, Nees. Syst. 34. On dead oak twigs, at Hermosa, 29 March; n. 21.

Dematiaceæ.

Camptoum cuspidatum, Cke. & Hark. Grev. xii. 33. On dead stems of *Scirpus*, Durango, 22 March; n. 17.

Cladosporium typharum, Desm. Sacc. Syll. iv. 366. On dead leaves of *Typha*, at Hermosa, 4 April; n. 18.

Macrosporium puccinioides, Ell. & And. Bot. Gaz. (1891), 47. On dead twigs of *Chrysothamnus*, at Durango, 21 March; n. 34.

This striking fungus can hardly belong in the genus *Macrosporium*. Its compact growth suggests the *Tuberculariaciæ* rather than the *Dematiaceæ*. The only recognized genus of the former family with muriform spores is *Spegazzinia*, but our fungus differs widely from that genus in habit and in that the corridia are not borne on sterigmata but on the ends of the sporophores.

Tuberculariaceæ.

Trimmatostroma Americana, Thüm. Myc. Univ. n. 793. On dead willow twigs, Durango, 20 March; n. 72.

Tubercularia miniata, n. sp. Sporodoches thickly scattered, erumpent, prominently convex, constricted below, large, 1–2mm., bright salmon red, texture fibrous rather than waxy, in cross section the fertile portion, colored alike

within and without, divided by a distinct darker line from the pale-yellow sterile basal portion; conidiophores very long, somewhat curved, simple, 80–150μ or more by 2μ; conidia borne laterally, oval, hyaline, ends obtuse, about 8x3μ.

Common on dead stems of *Sambucus*, near Pagosa Peak, 9,000 feet, 25 Aug.; n. 73.

This is easily distinguished from *T. Sambucina* by the larger softer sporodoche, the larger thicker conidiophores and the much larger conidia. In specimens of the latter species examined from Europe and from Wisconsin the conidia are only 5–6x1½μ.

TUBERCULARIA, sp.? On dead branches of oak, Hermosa' 30 March; n. 74.

This is a very peculiar fungus. The large 2–3mm. sporodoches swarm with motile bacteria-like bodies. The conidiophores seem to be only 8–12x1μ and variously branched or united. The conidia are about 2–3x1μ. It is externally brown, but vermilion-red within, and crumbling to a red powder. It suggests the red stroma of some *Endothia*-like fungus rather than a *Tubercularia*, but no perithecia could be detected.

LICHENES.

By T. A. WILLIAMS.

Cladonia fimbriata, Fr. On bare banks at 11,000 feet near Pagosa Peak, Aug.; n. 93.

CLADONIA SCARIOSA SQUAMULOSA, Muell. Same station with the above, on the ground in spruce woods; n. 94.

EVERNIA FURFURACEA, Mann. Near Pagosa Peak at 9,000 feet, on dead standing trunks and branches of spruce; n. 95.

LECANORA CINEREA, Sommerf. On granite boulders at Hermosa, March; n. 96.

LECANORA MURALIS SAXICOLA, Schaer. Same station and habitat as the last; n. 97.

LECANORA RUBINA OPACA, Ach. With the two preceding; n. 98.

Parmelia conspersa, Ach. With the foregoing; n. 99.

PLACODIUM ELEGANS, DC. On boulders and ledges at Hermosa, March, forming bright-colored patches often conspicuous at a distance; n. 101.

Rhinodina sophodes EXIGUA, Fr. On dead twigs and branches of juniper and the Douglas spruce at Hermosa, March; nn. 102, 103.

THELOSCHISTES POLYCARPUS, Tuckerm. In bright-colored patches on branches of oak at Hermosa, March; n. 105.

HEPATICÆ.

By L. M. UNDERWOOD.

LOPHOZIA VENTRICOSA, Dicks.

BLEPHAROSTOMA TRICHOPHYLLUM, Dumort. Both these taken together, from a decaying log in a wet spruce wood at 9,000 feet near Pagosa Peak, Aug.; n. 106.

MUSCI.

By N. C. KINDBERG.

BRYUM CÆSPITITIUM, Linn. On the ground at base of trees at Hermosa, April; n. 107.

BRYUM PIRIFORME, Hedw. On the ground, at 9,000 feet, near Pagosa Peak, Aug.; n. 108.

CERATODON PURPUREUS, Brid. About roots of shrubs, at Durango, March; n. 109.

DICRANUM RHABDOCARPUM, Sulliv. At 9,000 feet near Pagosa Peak, Aug.; n. 110.

DICRANUM SCOPARIIFORME, Kindb. With the last; n. 112.

DISTICHIUM CAPILLACEUM COMPACTUM, B. S. On the ground, in Graham's Park, 7,800 feet, May; n. 111.

GRIMMIA PULVINATA, Sm. On boulders, at Hermosa, March; n. 114.

HYPNUM REPTILE, Rich. On rocks along the river at Graham's Park, May; n. 115.

HYPNUM REVOLUTUM, Mitt. At 9,500 feet, near Pagosa Peak, Aug.; n. 116.

HYPNUM UNCINATUM, Hedw. River banks in Graham's Park, 7,800 feet, May; n. 118.

ORTHOTRICHUM KINGIANUM, Lesq. Moist rocks near Pagosa Peak at 9,500 feet; n. 120.

PHILONOTIS FONTANA, Brid. On dripping rocks near Pagosa Peak, 9,500 feet, Aug.; n. 121.

POLYTRICHUM ALPINUM, Linn. In moist subalpine spruce woods about Pagosa Peak, 11,500 feet; n. 122.

SPHAGNUM TERES SUBSQUAROSUM, Warnst. Margin of a small pond at Cumbres, 10,000 feet, Sept.; n. 123. This was the only *Sphagnum* seen, and the specimens were determined by Warnstorff.

WEBERA ALBICANS, Sch. At 9,500 feet, near Pagosa Peak, Aug.; n. 124.

FILICES.

ASPLENIUM FILIX FŒMINA, Bernh. Schrad. Journ. i, part 2, p. 26. At 9,000 feet, near Pagosa Peak, Aug.; n. 125.

CRYPTOGRAMME ACROSTICHOIDES, R. Br. App. Frankl. Journ. 767. At 11,500 feet, near Pagosa Peak; n. 126.

CYSTOPTERIS FRAGILIS, Bernh. Same region, at 9,000 feet; n. 127.

PTERIS AQUILINA, Linn. Sp. 1075. Same region, at 9,000 feet; n. 128.

CONIFERÆ.

Pinus ponderosa scopulorum, Engelm. Chama, N. Mex., 8 Sept.; n. 134.

PINUS FLEXILIS, James, in Long's Exp. ii, 27, 35. Graham's Park, 8,700 feet, May; n. 133.

Picea Engelmannii, Engelm. At 9,000 feet, near Pagosa Peak; n. 131.

PICEA PUNGENS, Engelm. in Gardn. Chron. (1879) i, 334. Chama, N. Mex., at 7,800 feet, Sept.; n. 132.

Abies concolor, Parry. Near Pagosa Peak, Aug.; n. 129.

Pseudotsuga taxifolia, Britt. Near Pagosa Peak, Aug.; n. 135.

Juniperus monosperma, Sarg. Aztec, N. Mex., April; n. 130, distributed as *J. occidentalis*.

TYPHACEÆ.

Typha latifolia, Linn. Flowering specimens from Pagosa Springs, 31 July; n. 136; of this species, nominally, but the spikes are too long and narrow. *T. latifolia*, so-called, in North America, is doubtless an aggregate. But the needed segregations can not be made on herbarium material always incomplete.

SPARGANIUM ANGUSTIFOLIUM, Michx. Fl. ii, 189. At 1,000 feet, mountains, near Pagosa Peak, 15 Aug., in flower only; n. 137.

ALISMACEÆ.

ALISMA BREVIPES, Greene, Pitt. iv, 158. Piedra, 12 July; n. 138.

GRAMINEÆ.

There is perhaps no section of the Middle West which presents more interesting or important agrostological problems than does this field of our 1899 explorations and researches. The pasturage is almost everywhere here most excellent; and even the alpine grassy slopes of vast extent far above the limit of trees are converted into a sheep pasture. And the still richer Piedra Meadows are famed throughout the whole southern Rocky Mountain region. The less elevated and more arid parts of the country have also their own grass flora of much importance, and this section in particular calls for careful investigation and experimentation in relation to the preservation and propagation of its forage plants.

In the determination of the species of the following list, invaluable service has been rendered by Mr. F. L. Scribner, to whom a set of specimens was sent for identification, and by the late Mr. T. A. Williams. Later Mr. C. L. Shear furnished some importnnt additions and corrections. The bibliographic citations and one or more alterations in nomenclature have been supplied by Dr. Greene. The somewhat extensive field notes are my own.

CARL F. BAKER.

PANICUM CAPILLARE, Linn. Sp. 58. In stony dry river bed at Piedra, Colo., 14 July.

HIEROCHLOE ODORATA, Wahlenb. Fl. Ups. 32. In damp shady places at Los Pinos, 21 June; also on rocky river bank at Arboles, 9 June. This was distributed under the generic name *Savastana*; but the editor of these Catalogues does not see how people who hold the law of priority to be fundamental, can consistently adopt *Savastana*, over which *Hierochloe* holds priority by more than forty years.

ARISTIDA LONGISETA, Steud. Syn. 420. Common in large tufts in dry ravines at Rosa, N. Mex., June; n. 152, issued as *A. purpurea*.

Aristida purpurea, Nutt. var. FENDLERIANA, Vasey. On stony mesa banks at Arboles, May; n. 153. Also a low inconspicuous form common in dry pine groves at Los Pinos, May; n. 154. Both numbers were distributed simply as *A. purpurea*.

STIPA MINOR, Scribn. Bull. Agrost. xi, 46. At Cumbres Pass, Colo., at 10,000 feet, Sept.; n. 218. The high open country at this point is a continuous meadow of many grasses, and this species is among the most conspicuous. Although many thousands of sheep and cattle are yearly pastured here, this grass, like the other *Stipa* species, remains untouched. Other specimens of the species are from Chama, N. Mex.; n. 219.

STIPA TWEEDYI, Scribn. l. c. 47. Arboles, June; n. 220.

STIPA VASEYANA, Scribn. l. c. 46. Abundant in tufts on dry open ground at Pagosa Springs, July; n. 221.

STIPA VIRIDULA, Trin. Mem. Acad. Petr. Ser. VI. ii. 39. Gato, Colo., on railway embankments, but not plentiful; n. 222.

Oryzopsis micrantha, Thurb. Frequent in small bunches,

especially along the borders of thickets, and along river banks at Arboles, June; n. 190.

Eriocoma cuspidata, Nutt. Gen. i. 40. Arboles, June; n. 189. One of the very earliest of vernal grasses. At Hermosa, where, among the dry hills and sandy banks, it is common, we found it in March, showing a short growth of fresh green leaves that seemed to be eagerly sought by cattle. The species is catalogued in Pl. Baker. i. 42, as *Oryzopsis cuspidata*.

MUHLENBERGIA AFFINIS, Trin. Mem. Acad. Petr. Ser. VI. ii. 301. Common at Chama, N. Mex., Sept., forming large tufts; n. 187.

MUHLENBERGIA COMATA, Benth. & Hook. Gen. Pl. iii. 1144. Common in dry beds of streams, forming large tufts, at 9,000 feet, near Pagosa Peak, Aug.; n. 188. Also collected at Arboles, 28 June.

Phleum alpinum, Linn. Abundant in all alpine meadows, at 12,000 feet, near Pagosa Peak, Aug.; n. 194.

Phleum pratense, Linn. In meadow lands about Pagosa Springs and at Arboles, July; n. 195.

ALOPECURUS GENICULATUS, Linn. Sp. 60. Common in wet and subalkaline soils along the river at Arboles, June; n. 151.

Sporobolus airoides, Torr. Aztec, N. Mex., May; n. 212; and at Arboles, Colo., June; n. 213. A common bunch grass of dry lands.

SPOROBOLUS CONFUSUS, Vasey, U. S. Herb. i. 56. Occurring in extensive patches on otherwise barren, dry, stony beds of streams at Piedra, July; n. 214.

SPOROBOLUS CRYPTANDRUS, Gray, Man. 576. Chama, N. Mex., Sept.; n. 215.

SPOROBOLUS DEPAUPERATUS, Scribn. Bull. Torr. Club, ix, 103. Arboles, Colo., June; n. 216; Chama, N. Mex., Sept.; n. 217; here quite common on shelving sand banks.

BLEPHARONEURON TRICHOLEPIS, Nash, Bull. Torr. Club, xxv, 88. A common grass, in small tufts, on ledges and in open ground at 9,000 feet, near Pagosa Peak, Aug.; nn. 155, 156. It was also found in a rocky river bed at Piedra, 14 July.

AGROSTIS ALBA, Linn. Sp. 63. A few specimens were collected in low land at Arboles, 28 June.

Agrostis exarata, Trin. A common grass in open places and along the borders of thickets, at about 9,000 feet, near Pagosa Peak, Aug.; n. 146. A smaller, weaker state of the species was collected at about 10,500 feet, and issued under n. 147.

Agrostis hyemalis, BSP. Near Pagosa Peak, at 10,000 feet, Aug.; n. 148. Pagosa Springs, July; n. 149. This is a very common grass in all moist places throughout the whole region.

AGROSTIS TENUICULMIS ERECTA, Nash. Found in but one locality, forming a large mat on an exposed ledge, at 10,500 feet, near Pagosa Peak, Aug.; n. 150.

CALAMAGROSTIS CANADENSIS ACUMINATA, Vasey. At 10,000 feet, near Pagosa Peak, Aug.; n. 160. Specimens from 9,000 feet, in the same mountains were distributed under n. 161. Those from the higher elevation were of less luxuriant growth, and the panicles were often deeply colored.

CALAMAGROSTIS SCOPULORUM, Jones, Proc. Calif. Acad. 2 Ser. v. 722. Near Pagosa Peak, at 9,000 feet, August.

Deschampsia cæspitosa, Beauv. Pagosa Springs, July; n. 165; these specimens large and with pale panicle; common in the meadows. Near Pagosa Peak; nn. 166, 167, 168; all highly colored alpine forms obtained at from 11,500 to 12,000 feet. An uncommonly long-awned alpine variety was issued under n. 170.

TRISETUM MONTANUM, Vasey, Bull. Torr. Club, xiii. 118. Common on moist open slopes near Pagosa Peak, at 9,000 feet; n. 223.

Trisetum subspicatum, Beauv. Near Pagosa Peak, at 9,000 feet, Aug., in small tufts on exposed ledges; n. 224. A taller state with more open panicle was found in soil more rich and moist.

DANTHONIA INTERMEDIA, Vasey, Bull. Torr. Club, x. 52. A reduced alpine form, common on grassy slopes at 12,000 feet near Pagosa Peak; n. 164. A much taller and well developed form occurs on the lower open slopes.

SCHEDONNARDUS PANICULATUS (Nutt.), Trelease. Arboles, June; occasional, on dry ground.

Bouteloua curtipendula, Torr. At Rosa, N. Mex., in small mats on the stony mesa lands; rather common, and closely cropped by sheep and goats; also seen at Arboles, Colo.

BOUTELOUA PROSTRATA, Lag. Gen. & Sp. 5. Common along the borders of low alkaline sinks, at Chama, N. Mex., Sept.; n. 163.

Beckmannia erucæformis, Host. A small form of this was taken in moist ground at Pagosa Springs, 28 July.

EATONIA OBTUSATA, Gray, Man. 2 ed. 558. At Pagosa Springs, July; n. 169; also at Arboles, June; n. 171.

Kœleria cristata, Pers. Pagosa Springs, July; n. 184; Arboles, June, 185. Common and conspicuous in dry open lands.

Melica parviflora, Scribn. Abundant on open mountain sides at 9,000 feet, near Pagosa Peak, Aug.; n. 186.

Poa alpina, Linn. At 10,500 feet, near Pagosa Peak, and common at such altitudes, Aug.; n. 196.

POA BREVIFOLIA, Muhl. Gram. 138. Common on hillsides in pine woods, especially on ground moistened by seepage from irrigation ditches at Los Pinos, May; n. 197.

Poa epilis, Scribn. Common on alpine slopes at 11,500 feet, near Pagosa Peak, Aug.; n. 198.

Poa Fendleriana, Vasey. Near Pagosa Peak at 11,500 feet, Aug.; n. 199. And a form said to approach the var. *Arizonica* was obtained at Los Pinos and issued under n. 200.

POA FLEXUOSA, Muhl. Gram 148? Near Pagosa Peak at 10,500 feet, Aug.; n. 201.

Poa leptocoma, Trin. Near Pagosa Peak, Aug. Two forms were issued; a slender weak plant from 9,000 feet, as n. 202, and a stout one from 11,500 feet as n. 203.

POA LONGILIGULA, Scribn. in Beal, Grasses, ii. 532. Aztec, N. Mex., May; n. 204. It was surprising to find, at so early a date, large fresh bunches of this grass, approaching maturity on the dry mesa banks. It would undoubtedly be a grass of great value if amenable to cultivation in this its native region. But no attempt seems to have been made in

this direction, although there is an agricultural experiment station at this very point.

Poa longepedunculata, Scribn. Near Pagosa Peak, at 12,000 feet, Aug. Two varieties were distributed, nn. 205, 206, both common on alpine grassy slopes.

Poa nemoralis, Linn. Near Pagosa Peak at 10,000 feet. 18 Aug. A form very near to *P. rupestris* was issued as n. 207, this from an altitude of about 12,000 feet.

Poa occidentalis, Vasey. At 9,000 feet, near Pagosa Peak.

Poa pratensis, Linn. Near Pagosa Peak at 9,000 feet, Aug.; n. 308. What have been determined as varieties of this species were obtained at Los Pinos in May, and at Pagosa Springs in July; but that they are specifically identical with the mountain plants seems a strange proposition.

Poa reflexa, Vasey & Scribn. U. S. Herb. i. 276. No. 209 is said to be a form of this with short leaves and rather large spikelets. It is common at about 12,000 feet, near Pagosa Peak.

Poa vaseyana, Beal, Grasses, ii. 532. Habitat of the last, at about 11,500 feet; n. 209; said to be larger and more robust than the type, with rougher foliage and sheaths, large and more acute as well as more woolly-pubescent glumes.

Graphephorum muticum. *Trisetum muticum*, Scribn. Bull. Agrost. xi. 50. Occasional in damp spruce woods at Cumbres, Colo., 10,000 feet, Sept.; n. 180.

Panicularia nervata, Kuntze. Pagosa Springs, Arboles and Piedra, June and July; n. 191. Also in two more or less dissimilar states from near Pagosa Peak, Aug.; n.

193, of small size and with drooping panicles; n. 194, large and strong, with long leaves and erect panicles.

FESTUCA ARIZONICA, Vasey, U. S. Herb. i. 277. Cumbres Pass, 10,000 feet, Sept.; n. 173. Pagosa Springs, July; n. 174. Also in dry river bed at Piedra, July. A common bunch grass wherever it occurs.

FESTUCA BREVIFOLIA, R. Br. in Parry 1st Voy. Suppl. Near Pagosa Peak, Aug. Two forms were distributed: n. 175 from 12,000 feet, and n. 176 from 11,500 feet. Both are common on the open alpine slopes and summits; and they have been determined as unquestionable *F. brevifolia* by our agrostologists, which is interesting in view of Dr. Theo. Holms' statement that the true *F. brevifolia* is not known to occur below the Arctic Circle.

FESTUCA FRATERCULA, Rupr. Bull. Brux. ix. (2) 236. Near Pagosa Peak, 9,000 to 9,500 feet, Aug. Two forms were distributed, nn. 177, 178, both abundant on rich, open slopes among the spruce woods, and both occurring either singly or in small tufts.

Festuca Thurberi, Vasey. Forming compact tufts on open slopes at 10,000 feet near Pagosa Peak; Aug.; n. 179.

Bromus Porteri, Nash. At Arboles; June; nn. 157, 159. No. 157 was issued erroneously as *B. occidentalis*.

BROMUS RICHARDSONII, Link. Hort. Berol. ii. 281. Near Pagosa Peak at 9,000 feet, Aug.; n. 158. A tall and graceful plant very abundant on all the open slopes of the Pagosa Peak region.

AGROPYRUM DIVERGENS, Nees, ex Steud. Syn. 347. Frequent in small tufts in an old creek bed near Pagosa Peak, at 9,000 feet; Aug.; n. 139; not typical.

Agropyrum pseudorepens, S. & S. Bull. Agrost. iv. 34. At 9,000 feet near Pagosa Peak; n. 140.

AGROPYRUM SPICATUM, S. & S. l. c. iii. 12. Arboles, June; n. 142. A grass of very different aspect, with large, thick spikes, but said to be specifically identical with the other, was obtained at the Cumbres Pass in Sept.

Agropyrum Scribneri, Vasey. At 12,000 feet near Pagosa Peak, Aug.; n. 141. Frequent, and forming mats on open alpine slopes, the culms from almost erect to nearly prostrate.

Agropyrum tenerum, Vasey. Arboles, June; nn. 144, 145. Also found in a dry creek bed near Pagosa Peak at 9,000 feet, 10 Aug.

Agropyrum violaceum, Vasey. A common bunch grass of the highest alpine slopes near Pagosa Peak, Aug.; n. 144a.

HORDEUM JUBATUM, Linn. Sp. 85. Common in low meadows at Arboles, June; n. 183.

Elymus glaucus, Buckl. At 9,000 feet near Pagosa Peak, common; n. 172.

SITANION ELYMOIDES, Raf. Journ. Phys. (1819) 103. Arboles, June; n. 211.

SITANION LONGIFOLIUM, J. G. Smith, Bull. Agrost. xviii. 18. At 9,000 feet near Pagosa Peak, Aug.

Hilaria Jamesii, Benth. On stony declivities of the mesas at Arboles, June; n. 182; and at Aztec, N. Mex., May; n. 181.

Prospectus for the Collection of 1901.

My botanical field work in the Rocky Mountain region, begun nine years since, will be continued in 1901 and 1902, with better facilities and under conditions otherwise more promising than heretofore. The specimens will be of better quality. The determinations will be made by those botanists who are most competent to deal with matter from the West; thus making the collections authoritative, as representing in herbaria the flora of the several regions explored.

In 1901, the summer and autumn will be given to the field from Marshall Pass eastward and southwestward to the boundary lines of Colorado; a field, as far as known, exhibiting many peculiarites as to plant genera and species, and therefore of the highest promise. The ground will be covered as carefully as possible, at all elevations, *i. e.*, from 4,000 to 13,500 feet. This will be our third and probably the concluding series of our Colorado plants.

It is purposed to begin, in 1902, the exploration of a still newer field, that of the more westerly State of Nevada; and several years may be devoted to that field, prosecuting the work throughout many of its isolated and almost or altogether unexplored mountain ranges, and to the western and southern borders of the State.

Subscriptions to all these series are now being received, and should be registered as early as possible; for the sets go out to subscribers in the order of time recorded for the subscription, the fullest sets to the earliest subscribers. Arrangements have been made whereby it will be possible for any institution to obtain these sets. Correspondence is solicited.

A few short sets of the collections by Baker, Earle and Tracy in 1898 are still available. One good set of the 1899 collection, but lacking the grasses, sedges and rushes, though very rich in the new species, remains unsold. Its price is $73.

The distribution of mosses and liverworts from South America will soon be made. These include many new species.

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G83p
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